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AUTHOR Meehan, Merrill L.
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ABSTRACT

These specifications are intended to provide interested educators with a set of guidelines for the development of competency-based instructional modules. In the first of two chapters "essential" definitions and module components are presented. "Module, competency statement, and general, terminal, and enabling objectives" are defined. Seven major components of the competency-based instructional model are described; these components include the rationale/introduction, objectives, preassessment, instruction, self-evaluation, evaluation, and feedback. Chapter 2 examines the module organization, format, and layout. Module organization is discussed in terms of its requirements: (1) preliminary pages including title page, table of contents, and module overview sheet, (2) module body incorporating test and other pages, and (3) reference matter encompassing module resources and appendixes. In conclusion, the module format and layout are outlined, and guidelines are provided for paper selection, binding, type face, page numbering, margins, use of material other than typed copy, citations, copyrighted materials, and bias exclusion. The appendix contains sample module pages from a table of contents, overview sheet, module body, and resources page. (CSS)

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Competency-Based Instructional Module Specifications

Merrill L. Meehan

CE 019 892

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NATIONAL INSTITUTE OF EDUCATION

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND THE ERIC SYSTEM CONTRACTORS."

Competency-Based Instructional Module Specifications

by

Merrill L. Meehan

August, 1977

Pittsburgh, Pennsylvania

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PREFACE

The purpose of this publication is to provide a set of specific guidelines for the development of competency-based instructional modules to interested educators. While the literature is replete with rhetoric concerning competency-based education, it is noticeably devoid of specific aids to those seriously interested in developing, field testing, and adopting competency-based instructional materials into educational programs.

The instructional module specifications in this document have evolved from a decade of work in this area by the author. The culmination of these efforts is the instructional system model used as the basis for the components of competency-based instructional modules. This instructional system model has been utilized successfully with a variety of educational programs' target audiences including: (a) elementary and secondary students; (b) various levels of educators including preservice teachers, inservice teachers, principals, county office administrators, higher education personnel, and state education agency leaders; (c) numerous subject matter disciplines including career and vocational education; (d) educators from varied demographic backgrounds including rural, suburban, and urban. Results of the use of this instructional system model have been reported to the

profession in the form of journal articles and technical reports.

Competency-Based Instructional Module Specifications are just that--specifications. Explanations and justifications for said specifications are at a minimum because it is assumed readers of this publication are familiar with the basic concepts in competency-based education and, further, have utilized, to some degree, instructional design components. What follows is a rather straight forward presentation of specifications proven to be successful for the production of competency-based instructional modules.

M.L.M.
8-77

CHAPTER I

MODULE DEFINITIONS AND COMPONENTS

A. Essential Definitions

1. Module

This term applies to a cohesive, integrated set of instructional materials aimed at developing student proficiency in one or more of a program's competency statements. Following the definition of individualized instruction offered by Edling (n.d.), the educational agency selects appropriate objectives for the learner and also prescribes appropriate instructional strategies for learners mastering those objectives. Educational agency is defined in broad terms so as to include a state agency, a local agency, an institution, or any instructor. As used in the instant situation, the agency's instructional objectives are included in the competency-based instructional module. In competency-based instructional programs, the learner works at his/her own best rate and may bypass instruction he/she has already mastered. It is assumed that in many portions of the instructional module alternative but equivalent learning activities can be identified and named. All other materials not meeting the definitions, specifications, and evaluative criteria established in this publication are to be labeled Instructional Materials.

2. Competency Statement

This term applies to those skills, concepts, performances, and attitudes required of learners enrolled in a competency-based program. The program's competencies may be determined by conceptual, perceptual, and/or task analyses. A program's competency statement identifies an instructional goal or goals in terms of an action verb or verbs and content area(s). Competency is an inference based upon a sample of a person's behavior. Performance is, simply stated, behavior. Performance is what we observe in determining competence. Therefore, competency is the overall concept which encompasses the concept of performance.

3. General Objective

This term refers to a single instructional goal or aim which describes the desired learner behavior and content area(s). Competency-based instructional modules' general objectives are derived from the program's set of competency statements. Generally, each verb in the competency statement dictates a general objective in the instructional module.

4. Terminal Objective

This term refers to a statement which: (a) describes the behavior the learner will perform via an action verb, (b) the content area relative to the action verb, (c) and identifies the learner who is the target of a sequence of

learning activities. Terminal objectives should be written to the domains of learning and relevant levels within those domains.

5. Enabling Objectives

This term refers to a statement which describes the behavioral indicators that each terminal objective has been mastered by a learner. As such, enabling objectives identify samples of learner behavior indicative of the related competency. Thus, after demonstration of the behaviors stated, competency can be inferred. Module enabling objectives consist of, as a minimum, (a) the learner term, (b) a statement of the conditions under which the desired behavior will be performed, (c) the observable behavior to be performed in an action verb mode, (d) a statement of the content area for the behavior, and (e) a statement of the criterion level or minimal acceptable performance level.

B. Module Components

In this publication, competency-based instructional modules follow the instructional system model shown in Figure 1. Major components of this instructional system model are: (a) rationale/introduction, (b) objectives, (c) preassessment, (d) instruction, (e) self-evaluation, (f) evaluation, and (g) feedback. At two points in the model the learner must decide if he or she has mastered the content as presented. Either response (Yes or No) prescribes

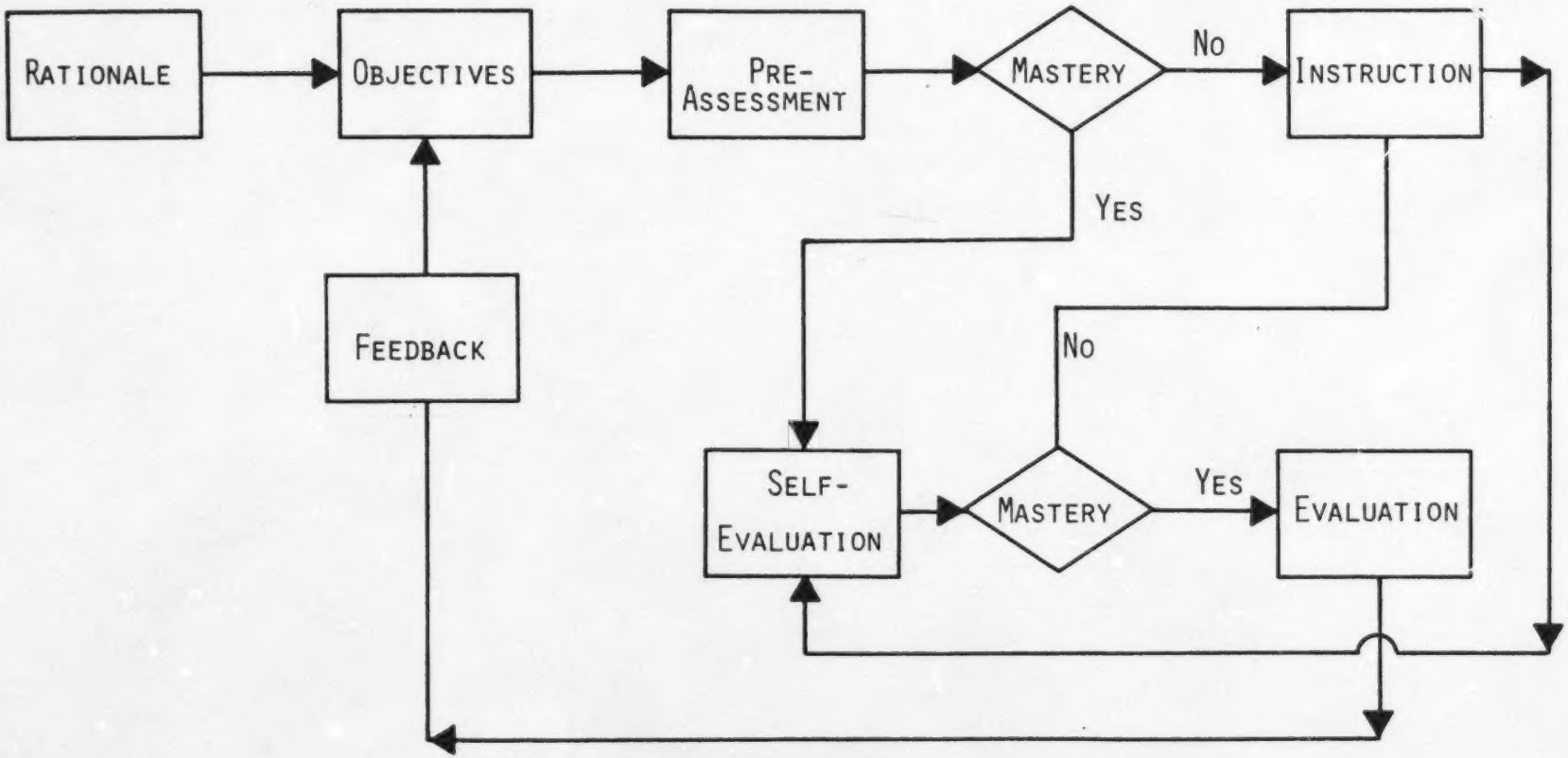

FIGURE 1. INSTRUCTIONAL SYSTEM MODEL

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what step he or she should take next.

Competency-based instructional modules' components are described below. The descriptions of these components can be viewed as evaluative criteria for assessing said module components.

1. Rationale/Introduction

This component provides the "Gestalt" and shows the relationship between and among the instructional module components. It includes a clear statement of purpose that establishes set and relevance for the instructional materials. Ideally, it is derived from a theory or theories. Last, it communicates the intent of the materials in the language level of the participants.

2. Objectives

In competency-based modules, three levels of instructional objectives are used as defined above. In all cases, the objectives are to be achievable and relevant to the learner. They are to be consistent, sequentially ordered, and lead to the module's competency statement(s). All levels of objectives should state precisely and clearly what the learner is expected to perform and the content area(s) for said performance. The terminal and enabling objectives both state clearly the learner term while the enabling objectives state precisely and clearly the conditions under which the learner is expected to perform and how well he or she is expected to perform. All objectives should be addressed to the domains of learning and reflect

various levels of those domains--ideally, the higher levels. In actual practice, the objectives may become part of the instruction component.

3. Preassessment

This component of the module is diagnostic in nature and guides the learner into the instruction or other components of the module. The preassessment is the first decision point for the learner and serves as an aid to completing materials that follow. This component creates positive motivation and encourages active participation for the components that follow. It necessarily contains items related to each and every module enabling objective; is based on their criterion levels; and is tied to content, attitude, and performance.

4. Instruction

Within each module, instruction is personalized whenever possible so that the instructional mode matches the learning style of the participant. The instruction is criterion-referenced and includes a variety of verbal and non-verbal techniques. It provides for psychological set, asks meaningful questions, and establishes closure at appropriate points; it includes activities that are meaningful to the age and educational level of the targeted learners. Module instruction is humanistic in that it utilizes alternative, but equivalent, activities and/or instructional modes for learners. The instruction should provide positive

reinforcement for learners, considers a time frame for accomplishment, and lists all necessary resources for completion.

5. Self-Evaluation

This portion of the module is learner-oriented and learner-completed. It tells the learner if he/she needs further instruction and specifically on which objectives. It is an individual progress report which culminates in a decision of mastery or non-mastery. This module component measures performance, content, and attitudes and tells the learner what he/she needs to assemble before going on to the evaluation component.

6. Evaluation

This component is a collaborative venture between the learner and mentor which results in objective data. The evaluation component provides evidence to indicate learner performance in terms of the criterion level of the objectives. It also reflects attitudes of the learner towards the instructional material in addition to content. The evaluation component is a humanistic one since the results are used to foster continuous progress of the learner's development and not to rank or compare learners against each other.

7. Feedback

Data regarding the learner's achievement of the modules' objectives provides valuable feedback to the instructional designer. Data assessing the reliability and validity of the

modules' objectives is another form of feedback. Learner attitudes toward the module itself in terms of organization, format, content, graphics, and other related aspects are still other examples of useful data to the designers of competency-based programs.

CHAPTER II

MODULE ORGANIZATION, FORMAT, AND LAYOUT

A. Module Organization

In addition to the cover, competency-based instructional modules should consist of three main sections. These sections are: (1) preliminary pages, (2) body of module, and (3) reference matter. Each section's component parts and pages are described below.

1. Preliminary Pages

a. Title Page. Each competency-based module shall have, as its first page, a non-numbered title page which includes the following elements: (a) the module title reflecting the content and, if applicable, module number, (b) the author or authors with no affiliations stated, (c) if applicable, a paragraph crediting the funding source, naming the project itself, and identifying the project director and/or project manager, (d) the date of publication, and (e) place of publication including the university name, the department within the university, and the city and state. The arrangement of these elements can be seen on the sample title page in the Appendix. It is suggested that the module title should begin with the gerund form of the verb or verbs in the competency statement. Field test

versions of instructional modules should be clearly labeled as such; revised editions should be so noted.

b. Table of Contents. The table of contents page lists the preliminary page names, the major sections of the module body, and the reference matter along with page numbers for each. The major component parts of instructional modules are equivalent to chapters of a paper or a thesis and are labeled with Roman numerals and titled by the module part name, i.e. I. Rationale/Introduction, II. Preassessment, III. Instruction, IV. Self-Evaluation, V. Evaluation, VI. Feedback. Chapter VII is the reference matter and is titled Module Resources.

Chapter III--Instruction will comprise the bulk of the module and, as such, will be subdivided the most. However, all other chapters may be subdivided by the writer in order to present their organization. Each general objective of the instruction chapter will be identified and indented 8 spaces from the left margin. Each terminal objective for each general objective will be located under its general objective and indented 11 spaces from the left margin, and each enabling objective will be located under its terminal objective indented 14 spaces from the left margin. All indentation will be consistend throughout the Table of Contents. The learning activities for each enabling objective will be located under their enabling objective; they may be grouped together for identification purposes.

The module resources' subdivisions will include the texts, articles, reports, pamphlets, materials needed, appendices, and any other reference matter grouped in a logical manner. See the sample table of contents page for details of the spacing, indentation, and leader dots.

c. Module Overview Sheet. The purpose of this single page is to provide the potential module user with a short, but complete, picture of the whole module. The overview sheet is not to be more than one page in length. Its essential parts named and underlined are: (a) program name, (b) unit number and name, (c) the competency statement for the module, (d) the module's general objectives, (e) the learning activities within the module, (f) the criterion evaluation procedures to be followed, and (g) the time frame needed to complete the module.

2. Body of Module

a. Text Pages. As indicated above, the body of the module shall consist of the six major module components of: rationale/instruction, preassessment, instruction, self-evaluation, evaluation, and feedback. The text pages of these components are to be numbered in Arabic numerals starting with the first page of the rationale/introduction. Each major subdivision within each module component may begin on its own page, if the writer so chooses.

The instruction component will be organized around the module's general objectives; each general objective

must begin on a new page with its number and content typed two inches down and centered on the page. Each terminal objective for each general objective will be typed with its number with two typed lines above it and one typed line below it. Each enabling objective will be listed and numbered under each terminal objective but without any typed lines under it. The learning activities will be typed under each enabling objective but flush to the left side margin with its number stated first; the words learning activity will be underlined. After the last learning activity some form of self-evaluation questions will be written, placed flush with the left side margin with the words self-evaluation underlined.

The only other typed line will be the line following the last sentence in the self-evaluation section for each enabling objective. This typed line visually separates the enabling objectives' contents from each other. Recall that a double typed line effectively separates the terminal objectives and makes them stand out. And also, recall that each general objective must begin on a new page centered, two inches down from the top; this lends visual organization to this portion of the instruction component. See the sample page of module body in the Appendix.

b. Other Pages. Within the body of the module there may be a variety of other types of pages. These could include, but are not limited to the following: tables,

graphs, illustrations, forms, instruments, pictures, drawings, charts, and activity sheets. There is no standard organizational pattern for all these pages with the exception that they be oriented to read on the vertical axis whenever possible, and that they have a one inch left side margin. The module writer should use good sound judgement with respect to the layout of these special pages; previous examples should serve as adequate reference points.

3. Reference Matter

a. Module Resources: This page or pages shall list all the books, articles, reports, pamphlets, regulations, laws, and other documents needed by a learner in order to complete the module. The module resources page should also list any special materials required of the learner as he/she completes the module's learning activities.

b. Appendices. This should be the last section of the module and may consist of a glossary of terms, list of abbreviations or other materials. Appendices may have their own numbering system, but this is to be avoided if possible.

B. Module Format and Layout

1. Paper

The paper is to be good grade of white bond, 8½ x 11. No colored stock is to be used except for the cover.

2. Binding

Each module is to be drilled to fit a standard 3 ring binder. This eases the insertion and removal of individual module pages. The modules may be "perfect" bound but this is not required.

3. Type Face

The type face is to be IBM Prestige Pica, Artisan, or any other clear, legible type face.

4. Page Numbering

Every page except the title page is to be numbered. The preliminary pages are numbered with small Roman numerals, centered on each page bottom. Main text pages and other pages of the body of the modules are to be numbered consecutively from front to rear, with Arabic numerals placed in the upper right hand corner. If unavoidable, appendices may have their own numbering system and sequence.

5. Margins

The left side (binding) margin is to be a minimum of 1" for all pages, regardless of orientation. The top and bottom margins are to be a minimum of 3/4" and the right side margin is to be a minimum of 1/2". Pages which are not conventional (e.g., instruments, graphs, forms, etc.) should have suitable margins whenever possible.

6. Other than Typed Copy

All copy not typewritten is to be done in black india ink or other materials suitable for copying and reproduction purposes. Examples include cartoons, graphs, figures, charts, etc.

7. Citations

All citations are to follow the style of the: Publication Manual of the American Psychological Association: Second Edition, 1974.

8. Copyright

All non-original ideas, materials, and passages are to be properly cited in order to avoid copyright infringements.

9. Biases

Instructional modules are not to include any instances of sex, race, age, creed, color, religious, or ethnic biases.

APPENDIX

Sample Module Pages

--Sample Title Page--

Organizing the Line Production Activity: A Self-Instructional Module

Written by

Merrill L. Meehan

FIELD TEST VERSION

Developed for Industrial Arts Education 363
in the Industrial Arts Education Curriculum
Dr. Ronald L. Koble, Chairperson

February, 1975

The Pennsylvania State University
College of Education
University Park, Pennsylvania

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--Sample Module Overview Sheet--

CBVAP Self-Instructional Module

MODULE OVERVIEW SHEET

Program: Competency-Based Vocational Administration Program (CBVAP)

Unit: II, Organization and Administration

Competency Statement: Develop and submit for approval / assist in the development of / short-range (one year) and long-range (five years) administrative plans regarding vocational programs. CBVAP competency number seven.

General Objectives: There are two general objectives of this module. First, you will develop an original vocational administrative plan for a simulated area vocational-technical school in Pennsylvania. Second, you will submit your plan for approval (evaluation).

Learning Activities: Within this module are several learning activities leading you in a systematic manner to develop and submit an original administrative plan. You will read information sheets and then identify the types and elements of administrative plans. Next you will identify the parts of administrative plan objectives and recognize inputs to said plans. Then, given sample administrative plans, you will analyze and evaluate them. Following an identification of the steps in administrative plan development, you will prepare your own for an area vocational-technical school based on numerous inputs provided in the appendix. Finally, you will be asked to submit your plan for approval (evaluation).

Criterion Evaluation: Each module enabling objective states the exact standards by which your performance is judged. Model answers and feedback responses are provided. The evaluator will assess the final administrative plan in terms of previously established performance standards. You will also be asked to complete and submit a module attitude form.

Time Frame: Based on data obtained from the pilot testing of this module, you can expect to spend a total of about nine and one quarter hours reading and completing all the activities contained herein. This time estimation may be reduced if you elect to skip some of the learning experiences.

General Objective 1:
Research Various Sources of Vocational Education Curriculum

Terminal Objective 1.1:	The learner will research and review various sources for vocational curriculum development.

Enabling Objective 1.1.1:	Given an appropriate resource, the learner will identify the three major sources of the school curriculum from a consensus of the articles' authors.

Learning Activities:

1.1.1-A: Locate the softbound volume titled: What Are the Sources of the Curriculum: A Symposium by the Association for Supervision and Curriculum Development, 1962 and read this short (80 pp) pamphlet.

1.1.1-B: Analyze each author's article relating specifically to the sources of the curriculum.

1.1.1-C: Synthesize what this publication says are the three major sources of the school curriculum and identify them.

Self-Evaluation: Have you reviewed and synthesized what the authors say are the sources of the curriculum: Have you identified these three sources as being: (1) the nature of society, (2) the nature and nurture of the learner, and (3) organized knowledge?

If you didn't identify these three sources of the curriculum after synthesizing your reading, perhaps you could profit from rereading the ASCD pamphlet. When you have successfully completed this learning activity, you should proceed to the next one.

Enabling Objective 1.1.2:	Given appropriate resources, the learner will review and summarize on one page each two contemporary views of each of the three sources of the curriculum.

MODULE RESOURCES

Texts:

Davis, D. & Borgen, J. Planning, implementing, and evaluating career preparation programs. Bloomington, Illinois: McKnight, 1974.

Edling, J. V. Individualizing instruction: A manual for administrators. Corvallis, Oregon: Teaching Research Division, Oregon State System of Higher Education, n.d., ED 037 096.

Wenrich, R. D. & Wenrich, J. W. Leadership in administration of vocational and technical education. Columbus, Ohio: Merrill, 1974.

Journal:

American Vocational Journal, Volume 48, Number 7 (October, 1973) (Special issue on Curriculum).

Pamphlets:

Impellitteri, J. T. & Finch, C. R. Review and synthesis of research on individualizing instruction in vocational and technical education. Columbus, Ohio: Center for Vocational Education, 1971.

Other Materials:

Good 8-1/2 x 11 white bond paper, black felt tip pen, ruler or drawing triangle, about 1 dozen 3 x 5 index cards.